

trying to use the pumping lemma

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I want to show that $L = \{0^n \mid n^3 + 3n^2 - 2n \geq 0\}$ is not regular.

Here is my proof using the pumping lemma.

Is this correct?

First, observe a few strings in L

$0^0, 0^2, 0^4, 8$

Now, assume L is a regular language accepted by some DFA M of s states.

Choose some a^s in L, where $|a| \geq s$. Divide a into $a = xyz = 0^s$.

Choose $x = 0$, $z = 0$, and $y = 0^s$. Now, for any way of dividing y into three parts uvw with v not equal to the empty string we already have a contradiction since for $v = 0$ we have 0^3 which is not in L.

How does that look?

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